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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/773,211	01/30/2001	Pramod G. Joisha	NWU-P005	4219

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San Jose, CA 95148

EXAMINER

KANG, INSUN

ART UNIT	PAPER NUMBER
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2124

DATE MAILED: 10/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/773,211	Applicant(s) JOISHA ET AL.	
	Examiner Insun Kang	Art Unit 2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 2/17/2004 and 6/14/2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-20 is/are pending in the application.
- 4a) Of the above claim(s) 1-9 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 10-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>2/17/2004</u> . | 6) <input type="checkbox"/> Other: _____ |

Art Unit: 2124

DETAILED ACTION

1. This action is in response to the amendment filed 6/14/2004.
2. As per applicant's request, claims 1-9 have been cancelled and claims 10-20 have been newly added. Claims 10-20 are pending in the application.

Drawings

3. The objection to the Drawings has been withdrawn due to the amendment to the Drawings.

Specification

4. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

The abstract of the disclosure is objected to because the abstract refers to purported merits or speculative applications of the invention (last sentence). Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 13 and 15-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 recites the limitation "the ranks" in line 3 and 5. There is insufficient antecedent basis for this limitation in the claim.

Claim 15 recites the limitation "the operand shape-tuples" in line 4. There is insufficient antecedent basis for this limitation in the claim.

As per claims 16 and 17, these claims are rejected for dependency on the above rejected parent claim 15.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 10-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 10-20 are non-statutory because they are directed to a "method"

Art Unit: 2124

without recitation of a computer or a computer-readable medium embodying the method. The claims merely recite a "method" that is disembodied arrangement so as to be called a "computer program" or compilation of facts, information, or data *per se*, without creating any functional interrelationship, either as part of the stored data or as part of the computing processes performed by the computer ("acts") or computer readable medium so as to enable the computer to perform the claimed steps of determining an input shape-tuple, analyzing the use of each operand, etc as recited. Thus the claims represent non-functional descriptive material that is not capable of producing a useful result, and hence represent only abstract ideas. Therefore, the claims are non-statutory.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 10-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Rose et al. (A MATLAB to Fortran 90 Translator and its Effectiveness," ACM, 1996) hereinafter referred to as "Rose."

Per claim 10:

Rose discloses:

Art Unit: 2124

-determining an input shape-tuple for each operand of a program expression of an array-based language ("Our inference mechanism extracts the initial type information from four sources...type, rank, and shape are statically known," apge 309 right column; "Rank inference could be avoided by assuming, as MATLAB does, that all variables ... are matrices," page 312 left column; page 310 section 2.1)

-analyzing the use of each operand in the program expression ("the translator propagates shape information in terms of input values. Built-in MATLAB functions can provide information for...inference," page 310 left column; and

-determining a resulting shape-tuple of the program expression using an algebraic framework as claimed ("The static intrinsic type inference mechanism propagates types through expressions using a type algebra similar to that described in...for SETL... Tables containing for each operation the type of the result as a function of the type of the operands are used to implement this algebra," page 311 left column; "we infer the range for the output value by performing the operation using the minimum and maximum values of the operands," page 311 right column) as claimed.

Per claim 11:

The rejection of claim 10 is incorporated, and further, Rose teaches that the array based language is MATLAB ("Type inference...MATLAB," page 309 right column) as claimed.

Per claim 12:

Art Unit: 2124

The rejection of claim 10 is incorporated, and further, Rose teaches:

-determining a rank of the resulting shape-tuple; and, promoting the input shape-tuples to an appropriate rank (page 312 section 2.4 Shape and Rank inference) as claimed.

Per claim 13:

The rejection of claim 12 is incorporated, and further, Rose teaches:

-determining the ranks of each input operand; identifying an operator corresponding to the input operands; and, ascertaining the rank of the resulting shape-tuple according to the operator and the ranks of the input operands (page 312 section 2.4 Shape and Rank inference) as claimed.

Per claim 14:

The rejection of claim 12 is incorporated, and further, Rose teaches:

-identifying the rank of the resulting shape-tuple; expanding the input shape-tuples to correspond with the rank of the resulting shape-tuple; and, appending trailing extents of expanded input shape-tuples with an appropriate value (page 312 section 2.4 Shape and Rank inference) as claimed.

Per claim 15:

The rejection of claim 10 is incorporated, and further, Rose teaches:

-identifying a built-in function in the program expression; determining a shape-tuple operator for the built-in function; and, applying the operand shape-tuples to the shape-tuple operator for the built-in function (page 312 section 2.4 Shape and Rank inference; "Rank and shape can be propagated through matrix constructors, through built-in functions that construct matrices based on the

Art Unit: 2124

parameters...through built-in functions that return matrices with the same shape as the input parameter...and through expressions in general," page 313 right column) as claimed.

Per claim 16:

The rejection of claim 15 is incorporated, and further, Rose teaches
-identifying a shape-tuple expression corresponding to the built-in function;
and, assigning the shape-tuple expression as the shape-tuple operator (page 312 section 2.4 Shape and Rank inference; page 313 right column) as claimed.

Per claim 17:

The rejection of claim 16 is incorporated, and further, Rose teaches:
-assigning a shape predicate to the resulting shape-tuple (page 312 section 2.4 Shape and Rank inference; page 313 right column) as claimed.

Per claim 18:

The rejection of claim 10 is incorporated, and further, Rose teaches:
-performing an array conformability check at run-time for a first statement;
and applying a result of the conformability check to a second statement (page 312 section 2.4 Shape and Rank inference; page 313 right column) as claimed.

Per claim 19:

The rejection of claim 18 is incorporated, and further, Rose teaches:
-determining a relationship among the first statement and the second statement (page 312 section 2.4 Shape and Rank inference; page 313 right column) as claimed.

Per claim 20:

Art Unit: 2124

The rejection of claim 18 is incorporated, and further, Rose teaches:

-preallocating a shape to a variable of a statement in a loop execution (page 312 section 2.4 Shape and Rank inference; page 313 right column) as claimed.

Response to Arguments

11. Applicant's arguments with respect to claims 10-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**.

See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Art Unit: 2124

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Insun Kang whose telephone number is 703-305-6465. The examiner can normally be reached on M-F 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on 703-305-9662. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

IK
10/1/2004


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